Form C-104
Rev. 10/07

VALUE ENGINEERING CHANGE PROPOSAL
MISSOURI DEPARTMENT OF TRANSPORTATION

Date 04/27/09

Contract ID 081121-403 **Job No.** J4P1138B

County JOHNSON **Route** 13 **Original Bid Cost** $15,552,776.86

Contractor IDEKER, INC **By** DAN TARR

Designed By _____ **Phone** _____

VECP # 09-34 **VECP** ☐ **or VECP/PDU** ☐

1. Description of existing requirements and proposed change(s). Advantages/Disadvantages

Contractor is to install wick drains and then place a 2' sand drainage blanket to form a horizontal drainage layer. We propose to use prefabricated strip drains in lieu of the sand blanket. Advantages of strip drains are that they are faster to install allowing consolidation to start sooner and the wick drains provide better drainage. According to manufacturer's literature strip drains provide over ten times the flow capacity of a 36" sand blanket. The sand blanket will be contaminated over time while the strip drain is protected by a geotextile fabric.

2. Estimate of reduction in construction costs. $481,895.47

3. Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations

NONE

4. Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.

04/28/09
(date)

5. Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.

_____ **NONE**
(date) (effect)

6. Dates of any previous or concurrent submission of the same proposal.

None
(date and/or dates)

Additional Comments:

*** Portion Below This Line To Be Filled Out by MoDOT ***

Comments:
The plans call for the installation of Wick Drains and a two foot sand blanket to be installed at the following locations: Station 680+00 to Station 682+18, and from Station 689+50 to Station 695+00 to accelerate the process of the fill settlement. Ideker has presented MoDOT with the proposal of using Strip Drains in conjunction with the Wick Drains to provide the same results. This falls under the Practical Design Value Engineering criteria. Ideker, Inc. has requested payment for the discovery. I recommend the 75% owner /25% contractor Practical Design Value Engineering.

Jon M Voss — 4/28/09
Submitted By Resident Engineer — Date

Comments:
WE CONCUR WITH THE RECOMMENDATION OF THE RE BUT BELIEVE, DUE TO THE NATURE OF THE VE, THE CONTRACTOR MAY BE ENTITLED TO A 50/50 DISTRIBUTION OF THE SAVINGS.

☒ **Approval Recommended**
☐ **Rejection Recommended**

Elizabeth A. Ufot (PTN) — 5/12/09
District Engineer — Date

Comments: THIS PROPOSAL IS A 50/50 V E. APPROVED PER DISTRICT RECOMMENDATION

☒ **Approval**
☐ **Rejection**

David D. Cooper for — 5-22-09
State Construction and Materials Engineer — Date

Distribution: Resident Engineer, Project Manager, District Operations Engineer, State Construction and Materials Engineer
*Value Engineering Administrator - *MoDOT, P.O. Box 270, Jefferson City, MO 65102

Strip Drain Value Engineering Proposal

tem Numbe	Description	Bid Quantity	unit	Revised Quantity	Unit Price	Contract Change
Job Number 1138B						
100	Compacting Embankment	290,725	CY	314,325	$0.35	$8,260.00
260	Sand Blanket	23,600	cy	0	21.39	(504,804.00)
290	Wick Drains	48,591	LF	54,083	0.68	3,734.56
790	Subsurface Drainage Geotextile	3,159	SY	0	2.32	(7,328.88)
new	Strip Drains	0	LF	9,861	1.85	18,242.85
				Total for Job 1138B		(481,895.47)
Job Number 1138C						
2640	Compacting Embankment	552,333	CY	569,493	0.46	7,893.60
2820	Sand Blanket	17,160	cy	0	21.55	(369,798.00)
2850	Wick Drains	39,521	LF	44,249	0.62	2,931.36
3210	Subsurface Drainage Geotextile	3,725	SY	0	2.31	(8,604.75)
new	Strip Drains	0	LF	8,021	1.85	14,838.85
				Total for Job 1138C		**($352,738.94)**
				Combined Total Change		($834,634.41)

Mike A Fritz/SC/MODOT@MODOT
03/03/2009 03:37 PM

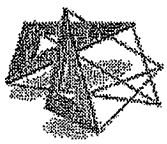
To Bruce A Harvel/D4/MODOT@MODOT
cc Alan D Miller/SC/MODOT@MODOT, James W Sharp/D4/MODOT@MODOT, Jon G Voss/D4/MODOT@MODOT, Kevin W
bcc
Subject Re: Fw: Hydraulic capacity

Bruce,

I talked to Jon Voss yesterday. We agree that as long as the strip drain has adequate capacity, the VE proposal should be okay.

Thanks,
Mike

Bruce A Harvel/D4/MODOT



Bruce A Harvel/D4/MODOT
03/03/2009 12:30 PM

To James W Sharp/D4/MODOT@MODOT
cc Alan D Miller/SC/MODOT@MODOT, Mike A Fritz/SC/MODOT@MODOT, Jon G Voss/D4/MODOT@MODOT, Perry J Allen/D4/MODOT@MODOT, Kevin W McLain/SC/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT
Subject Re: Fw: Hydraulic capacity

Jim,

You presented a good question. Off the top of my head, I currently don't have the answer. Historically MoDOT has used a sand blanket to drain any excess pore water pressure that gets generated. I realize the blanket thickness and the gradation of the sand influences the capacity of the blanket. I am assuming at some point time the hydraulic capacity of a 2' sand blanket may have been estimated with a specified gradation on past projects? I'm guessing it's a fairly easy calculation to perform.

In order to assist you, I am going to forward your question to the Central Office and see if they can help us out?

Ultimately, I can appreciate the contractors inquiry. I'm assuming, Ideker wants to select the proper strip drain to prevent any potential for a "blow out" as they pursue their VE proposal and the construction of the embankment?

Bruce A. Harvel
District Geologist
Missouri Department of Transportation
600 NE Colbern Road
Lee's Summit, MO 64086
Office (816) 622-6522 Fax (573) 526-0031
email Bruce.Harvel@modot.mo.gov

James W Sharp/D4/MODOT

James W Sharp/D4/MODOT
03/03/2009 11:02 AM

To Bruce A Harvel/D4/MODOT@MODOT
cc
Subject Fw: Hydraulic capacity

Jim Sharp
Senior Construction Inspector
Clinton Project Office
(660) 885-5665 (Office)
(660) 890-5062 (Mobile)

----- Forwarded by James W Sharp/D4/MODOT on 03/03/2009 11:01 AM -----

Paul C Boenisch/D4/MODOT
03/03/2009 10:55 AM

To James W Sharp/D4/MODOT@MODOT, Bruce A Harvel/D4/MODOT@MODOT
cc Amy S Nash/D4/MODOT@MODOT, Dennis K Buckley/D4/MODOT@MODOT, Dwayne C Severs/D4/MODOT@MODOT, Jon G Voss/D4/MODOT@MODOT, Kevin W McLain/SC/MODOT@MODOT, Perry J Allen/D4/MODOT@MODOT, Regina R Shipley/D4/MODOT@MODOT, Richard S Uptegrove/D4/MODOT@MODOT
Subject Re: Hydraulic capacity

Jim,

The two foot thickness was provided by Bruce Harvel. Since this is a geology question, Bruce is the best person to contact to see if substitution is possible.

Paul

James W Sharp/D4/MODOT

James W Sharp/D4/MODOT
03/03/2009 10:19 AM

To Paul C Boenisch/D4/MODOT@MODOT, Perry J Allen/D4/MODOT@MODOT, Amy S Nash/D4/MODOT@MODOT, Regina R

Shipley/D4/MODOT@MODOT, Kevin W
McLain/SC/MODOT@MODOT
cc Jon G Voss/D4/MODOT@MODOT, Richard S
Uptegrove/D4/MODOT@MODOT, Dwayne C
Severs/D4/MODOT@MODOT, Dennis K
Buckley/D4/MODOT@MODOT
Subject Hydraulic capacity

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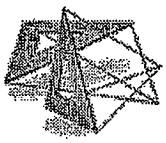

Bruce A Harvel/D4/MODOT
03/04/2009 10:28 AM

To Alan D Miller/SC/MODOT@MODOT
cc Perry J Allen/D4/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT, Mike A Fritz/SC/MODOT@MODOT
bcc
Subject Re: Fw: Hydraulic capacity

We're thinking the same on this.....I was thinking about applying 1.25 SF which would bump it up to a minimal sustained load of 4688 psf?

The other thought I have..... are we comfortable that we can achieve an acceptable or comparable rate of settlement with the Ameri-drain versus the sand blanket? I think Mike may have hit on this or inferred this a little bit with the Hydraulic Capacity of the strip drain? I am assuming it will be OK? By contract, Structure No. A-7684 and A7477 requires the contractor to hold off or delay the approach slab and pavement construction for 5 months or until the settlement is complete? Structure No. A7475 has same type of delay, but it's 2 month's. Not 100% sure.....and I might be wrong, but I think these are structures associated with the Wick Drains. Once the 2 month and 5 month time period has passed, I'm assuming the contractor will want to start the approach slab and pavement construction regardless if we use the strip drain or the sand blanket.

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email Bruce.Harvel@modot.mo.gov

Alan D Miller/SC/MODOT

Alan D Miller/SC/MODOT
03/04/2009 09:57 AM

To Bruce A Harvel/D4/MODOT
cc Perry J Allen/D4/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT
Subject Re: Fw: Hydraulic capacity

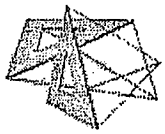
probably a little higher, height of fill, plus equipment running around on top of fill.

Alan D. Miller, M.S., P.E.
Geotechnical Engineer
Geotechnical Section
Construction and Materials
Bus. (573) 526-5730
Fax (573) 526-4345
alan.miller@modot.mo.gov

Bruce A Harvel/D4/MODOT

Bruce A Harvel/D4/MODOT

To



03/04/2009 09:54 AM

Alan D Miller/SC/MODOT@MODOT

cc Perry J Allen/D4/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT

Subject Re: Fw: Hydraulic capacity

I guessing the Ameri-drain would need to be able to tolerate or sustain a minimal unit load.....say of 3,750 psf? or would we want something a little higher with a an appropriate factor of safety? Just pulling this off the top of my head?

We could require some type of manufactures certification if you think it would be needed?

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email Bruce.Harvel@modot.mo.gov

Alan D Miller/SC/MODOT

Alan D Miller/SC/MODOT

03/04/2009 07:33 AM

To Bruce A Harvel/D4/MODOT

cc Mike A Fritz/SC/MODOT@MODOT, Perry J Allen/D4/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT

Subject Re: Fw: Hydraulic capacity

We are thinking

1. Clear and grub the site
2. Install the pore pressure devices
3. Install a couple of feet of fill as a work platform
4. Install some additional fill in the middle to crown the fill 2' to provide drainage in all directions
5. Install the wick drains
6. Install the Amer-drain perpendicular to C/L across the tops of the wick drains, daylighting at the SL

We had a couple of concerns;

The contractor needs to verify the Amer-drain will not cush under 30' of fill
How do you connect the wick drains to the Ameri-drains.

I guess staples or maybe cut a slit in the Ameri-drain and insert the wick drain. Or maybe cut a slit all the way through the Ameri-drain, pull the wick drain thru, flop it over and duck tape it.

Alan D. Miller, M.S., P.E.
Geotechnical Engineer

Geotechnical Section
Construction and Materials
Bus. (573) 526-5730
Fax (573) 526-4345
alan.miller@modot.mo.gov
Bruce A Harvel/D4/MODOT

Bruce A Harvel/D4/MODOT
03/03/2009 04:49 PM

To Mike A Fritz/SC/MODOT@MODOT
cc Alan D Miller/SC/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT, Perry J Allen/D4/MODOT@MODOT
Subject Re: Fw: Hydraulic capacity

Mike,

Please take a hard look at this for us. I'm sure you guys will get hit up with the formal review of the contractors VE proposal before any kind of acceptance. If accepted, we most likely would like to have some type acceptable performance measures and language addressed in the Change Order.

Thanks a bunch!

Bruce A. Harvel
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Missouri Department of Transportation
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email Bruce.Harvel@modot.mo.gov
Mike A Fritz/SC/MODOT

Mike A Fritz/SC/MODOT
03/03/2009 04:26 PM

To Bruce A Harvel/D4/MODOT@MODOT
cc Alan D Miller/SC/MODOT@MODOT, Thomas W Fennessey/SC/MODOT@MODOT
Subject Fw: Hydraulic capacity

Bruce,

We can probably come up with something. I'm thinking 2' of sand is probably overkill for the drainage capacity, but Tom has some good points too. We'll also need to make sure the proposed drain has whatever capacity we need under the planned amount of fill.

We'll kick it around here tomorrow and give you our thoughts.

Thanks,
Mike
----- Forwarded by Mike A Fritz/SC/MODOT on 03/03/2009 04:22 PM -----

Bruce A Harvel/D4/MODOT
03/03/2009 03:43 PM

To Mike A Fritz/SC/MODOT@MODOT
cc
Subject Re: Fw: Hydraulic capacity

Do we need to estimate the sand drain capacity as the project office has requested?

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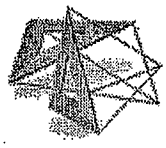

Voss/D4/MODOT@MODOT, Perry J
Allen/D4/MODOT@MODOT, Kevin W
McLain/SC/MODOT@MODOT, Thomas W
Fennessey/SC/MODOT@MODOT

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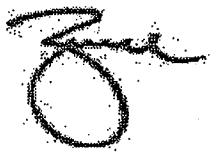

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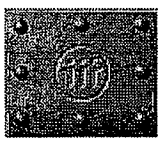

James W Sharp/D4/MODOT

03/03/2009 11:02 AM

To Bruce A Harvel/D4/MODOT@MODOT

cc

Subject Fw: Hydraulic capacity

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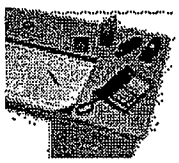

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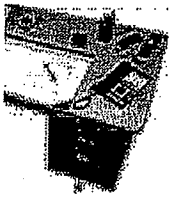

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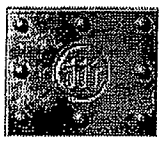

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VALUE ENGINEERING CHECK SHEET

TYPE OF WORK

(Check one that applies)

- ❑ Bridge/Structure/Footings
- ❑ Drainage Structures (RCP, RCB, CMP's, ect.)
- ❑ TCP/MOT
- ❑ Paving (PCCP, ect.)
- X Grading/MSE Walls
- ❑ Signal/Lighting/ITS
- ❑ Misc. _____

SUMMARY OF PROPOSAL

(If needed, condense summary to a couple of lines)

_____Use wick drains in lieu of planned 2' sand drainage blanket.

SCANNING OF DOCUMENT

If the proposal is large, please mark or make note, which pages need to be scanned into the database. If there are special instructions, make note of them here.

_____Scan proposal only.